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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/533,148	03/23/2000	Eddie Huey Chiun Lin	99-313	1189

32127 7590 11/17/2003

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EXAMINER	
BARQADLE, YASIN M	
ART UNIT	**PAPER NUMBER**
2153	16

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PRG

Office Action Summary	Application No.	Applicant(s)	
	09/533,148	LIN, EDDIE HUEY CHIUN	
	Examiner	Art Unit	
	Yasin M Barqadle	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *02 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *26-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Amendment

1. The Amendment filed 09/02/03 has been entered and made of record.

2. Applicant's arguments filed 09/02/03 has been have been fully considered but they are not deemed to be persuasive.

3. Claims 1-25 are presented for examination.

Election/Restrictions

Newly submitted claims 26-31 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: New claims are directed to a method of determining and identity of network device and setting the identity of the network device in an autonomous system while the original claims were directed more to a method for analyzing a data network having plurality of routers.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 26-31 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

In response to applicant argument on pages 10 and 11, that paragraphs 0010 and 0031-0034 do not disclose accessing OSPF and static route information and determining if a particular network prefix is included in the accessed information. Examiner would like to point out to the applicant particularly to the section in paragraph 0010 where Feldmann discloses populating a data model form a number of network information sources such as extracting information from a collection of router configuration files and where each section of the configuration files is read and parsed in a pre-specified order reflecting the dependencies within a single configuration file and across multiple configuration files. The data model comprises data objects containing information relating connectivity, addressing and routing in the packet switched-network. In paragraph (0032) Feldmann discloses that AS (autonomous system) typically employs an intradomain routing protocol, such as OSPF or IS-IS, to select paths across the backbone and that routers exchange this information and compute shortest paths. In large autonomous systems, each backbone link belongs to a single OSPF area, and each interface to a backbone link has an OSPF weight. This structure is reflected in the data model of links and interfaces, respectively where ultimately a router combines the information from the intradomain routing protocol (OSPF, IS-IS) with the interdomain reachability information (from static routes and BGP) to construct a forwarding table. Thus Feldmann clearly teaches constructing a forwarding table that consists information

combined from intradoamin routing protocol such as OSPF and interdomain reachability information from static routes and BGP. Concerning determining if a particular network prefix is included in the accessed information (parsed information), Feldmann explains how router processor such as the one in fig. 2, combines information from the intradomain and interdomain routing protocols to construct a forwarding table that is used to select the next-hop interface for each incoming packet (0024). Therefore, in order to select next-hop interface from forwarding table that is constructed from routing protocol information one must determine the particular prefix of the next-hop interface. Furthermore, Feldmann in paragraph (0028) discusses how interfaces are modeled as having attributes representing the interface's primary IP address and that each address associated with a particular prefix. For example, an interface may have IP address 10.34.56.77 in the prefix 10.34.56.76/30. Furthermore, router processor such as the one in fig. 2, combines information from the intradomain and interdomain routing protocols to construct a forwarding table that is used to select the next-hop interface for each incoming packet. This include the routing protocol traffic exchanged with other routers, e.g. link-state updates from neighboring routers required by OSPF, BGP sessions with other BGP speakers (0024). Feldmann discloses that interfaces are modeled as having attributes representing the interface's primary IP address, each address associated with a particular prefix. For example, an

interface may have IP address 10.34.56.77 in the prefix 10.34.56.76/30. Associating an interface with multiple IP addresses provides a way to overlay multiple links or eBGP sessions on a single interface (0028). Furthermore, in paragraphs (0030-0031), Feldmann discloses that neighboring routers exchange traffic over links. Each link is identified by an IP prefix, and each participating interface has a unique IP address with this prefix. For example, the prefix 10.34.56.76/30 consists of the IP addresses 10.34.56.76, 10.34.56.78, and 10.34.56.79. The addresses 10.34.45.76 and 10.34.56.79 are typically reserved for the network address and the broadcast address, respectively. Addresses 10.34.56.77 and 10.34.56.78 can be used to identify the two ends of a bi-directional, point-to-point link. Furthermore, in paragraph (0036), Feldmann discloses how ISP employs local policies to select a route for each destination prefix, and to decide whether to advertise this route to neighboring ASes. BGP policies can filter unwanted advertisements and assign local preferences, based on a variety of attributes. Then, the router executes the BGP decision process to select the best route to each destination prefix.

In response to applicant's arguments on pages 12-14, that ``Feldmann does not teach or suggest determining an identity of a network device based on an identity included in the accesses information corresponding to the network prefix'' and the argument that ``Feldmann does not teach determining and identity

of a network device using accessed tables when at least one of the accessed tables is determined to contain the network prefix''. Applicant's attention is drawn to paragraphs (0030 and 31) again where Feldmann discloses that neighboring routers exchange traffic over links. Each link is identified by an IP prefix, and each participating interface has a unique IP address with this prefix. For example, the prefix 10.34.56.76/30 consists of the IP addresses 10.34.56.76, 10.34.56.78, and 10.34.56.79. The addresses 10.34.45.76 and 10.34.56.79 are typically reserved for the network address and the broadcast address, respectively. Addresses 10.34.56.77 and 10.34.56.78 can be used to identify the two ends of a bi-directional, point-to-point link. Furthermore, Feldmann discloses that each link data object can be defined by an IP prefix attribute, which includes one or more IP addresses. Each link can be associated with a type--"backbone" or "edge"--that depends on the number of interfaces. A backbone link connects two or more routers inside the AS, and an edge link connects to a neighboring customer or peer (network operators have complete control over each backbone link). Furthermore, Feldmann discloses that IP address are utilized to identify the relationship between objects in the data model and that they are used to identify routers and interfaces and interfaces and to associate these components with links, BGP sessions and access-control lists (0039). Also, Fig. 4, clearly illustrates the process of populating the network model by processing router configuration files where

configuration data are all available for all of the routers in the IP backbone and that the data be consistent snapshot of the configuration in the network (0048). A snapshot of router configuration such as the one in figure 5, when read and parsed will show the identity of the router, name of the router, type of a router, customer name and customer's prefix, entries for the various protocols such as OSPF, BGP, and static routes. The configuration file also specifies static routes that associate destination prefixes with a particular interface. The BGP entry identifies the AS number (7018) and includes a number of commands that enable/disable certain features (e.g., route dampening and auto-summary) and control the aggregation of route advertisements involving certain IP prefixes (e.g., the "aggregate-address" command). Therefore, Feldmann teaches determining and identity of a network device using the accessed tables when at least one of the accessed tables contains the network prefix.

Finally, On page 14, applicant argues that Feldmann does not teach accessing one or more of a border gateway protocol peering table, a static route table, an open shortest path first route summarization table, and a network topology table, and determining whether one of accessed tables contains a particular network prefix. In addition to the above explanations, the examiner would like to point out that the information that is extracted and parsed as shown in the figures 4 and 5 include

network-wide view of topology and configuration information such as aggregate addresses, neighbor and peer-group information, routing protocols (static routes, RIP, BGP and OSPF). Fig, 4, clearly illustrates the process of populating the network model by processing router configuration files where configuration data are all available for all of the routers in the IP backbone and that the data be consistent snapshot of the configuration in the network (0048). The configuration file (fig. 5) also specifies static routes that associate destination prefixes with a particular interface. The BGP entry identifies the AS number (7018) and includes a number of commands that enable/disable certain features (e.g., route dampening and auto-summary) and control the aggregation of route advertisements involving certain IP prefixes (e.g., the "aggregate-address" command)(paragraph 0051). In addition, the "neighbor" commands are used to associate the router with a particular route-reflector group for iBGP (e.g., the "neighbor" commands involving the intra-att-cluster) and to configure eBGP sessions with a router in another AS (e.g., the "neighbor" commands with IP address 10.1.2.118 in AS 65001) (0051). Thus Feldmann clearly teaches constructing a forwarding table that consists information combined from network topology, intradoamin routing protocol such as OSPF and interdomain reachability information from static routes and BGP.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Feldmann Pub No. US (20020021675 A1)

As per claim 1 and 14, Feldmann teaches a method for analyzing a data network having a plurality of routers comprising (abstract):

accessing at least one of static routing information and route summarization information from router [relevant information is extracted from a collection of router configuration files and where each section of the configuration files is read and parsed. The information that is extracted and parsed as shown in the figures 4 and 5 include network-wide view of topology and configuration information such as routing protocols (static routes, RIP, BGP and OSPF) in which forwarding routing tables are constructed [Figs. 4 and 5; page 1, paragraphs 0010 and page 3, Paragraphs 0030-36; see also

paragraph 024];

determining if particular network prefix is included in the accessed information [page 2, paragraphs 0024-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051];

determining an identity of a network device based on an identity included in the accessed information corresponding to the network prefix [an example of device identity could be router name, router type, router location, border area router, edge linking router, router with next-hop interface , backbone linking router, router where the packet is received and router where the packet is to exit. See page 2, paragraphs 0022-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051. See also page 4, paragraph 0039 and Figs. 4 and 5]; and

analyzing the data network using the determined identity [Fig. 4 and page 3, Paragraphs 0028-36; see also page 4, paragraph 0039].

As per claim 2 and 15,Feldmann teach a method wherein the accessing includes:

accessing at least one of a static routing table and open shortest path first route summarization table [Figs. 2 & 4; page 3, Paragraphs 0030-36].

As per claim 3 and 16, Feldmann teach a method wherein determining includes:

determining router information, interface information, and

association information for the networks prefix [Fig. 1, page 2, Paragraphs 0024-36].

As per claim 4 and 17, Feldmann teach the method wherein analyzing includes:

analyzing traffic of data network [page 2, Paragraphs 0022-0028].

As per claim 5 and 18, Feldmann teach the method wherein analyzing includes:

modeling the data network [page 2, Paragraphs 0022-0024].

As per claim 6 and 19, Feldmann teach the method wherein the determining includes:

determining an identity of an exit or entry router in the data network [page 2, paragraphs 0024 to page 3, Paragraphs 0031. See also page 4, paragraph 0039].

As per claim 7, this is a means claim with similar limitations as claims 1 and 14 addressed above. Therefore, it is rejected with the same rationale.

As per claim 8, Feldmann teach a system for analyzing a data network, said system comprising:

a memory configured to store information representing static routing information and route summarization information [the

configuration files for all routers in the network are read through to create a table storing every configuration line. figures 4 and 5 include network-wide view of topology and configuration information such as routing protocols (static routes, RIP, BGP and OSPF) in which forwarding routing tables are constructed [Figs. 2 and 4 and page 2, paragraphs 0024 and page 7, paragraph 0066]; and

a processor (fig. 2, 210) configured to:

access at least one of the static routing information and the route summarization information [relevant information is extracted from a collection of router configuration files and where each section of the configuration files is read and parsed. The information that is extracted and parsed as shown in the figures 4 and 5 include network-wide view of topology and configuration information such as routing protocols (static routes, RIP, BGP and OSPF) in which forwarding routing tables are constructed [Figs. 4 and 5; page 1, paragraphs 0010 and page 3, Paragraphs 0030-36; see also paragraphs 024];];

determining if a particular network prefix is included in the accessed information [page 2, paragraphs 0024-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051];

determining and identity of a network device based on an identity included in the accessed information corresponding to the network prefix [[an example of device identity could be router name, router type, router location, border area router, edge linking router, router with next-hop interface , backbone

linking router, router where the packet is received and router where the packet is to exit. See page 2, paragraphs 0022-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-51];]; and

analyze the data network using the determined identity [Fig.4 and page 3, Paragraphs 0031-36].

As per claim 9, Feldmann teach a system wherein, when accessing, the processor is configured to:

accessing at least one of a static routing table and open shortest path first route summarization table [Figs. 2 & 4; page 3, Paragraphs 0030-36].

As per claim 10, Feldmann teach a system wherein, when determining, the processor is configured to:

determining router information, interface information, and association information for the networks prefix [Fig. 1, page 2, Paragraphs 0024-31].

As per claim 11, Feldmann teach a system wherein, when analyzing, the processor is configured to:

analyze traffic of the data network using the determined identity [page 2, Paragraphs 0022-0024].

As per claim 12, Feldmann teach a system wherein, when analyzing, the processor is configured to:

model the data network using the determined identity [page 2, Paragraphs 0022].

As per claim 13, Feldmann teach a system wherein, when determining, the processor is configured to:

determine an identity of an exit or entry router in the data network [page 2, paragraphs 0024 to page 3, Paragraphs 0031. See also page 4, paragraph 0039].

As per claim 20, Feldmann teach a method for determining an identity of a network device, the network device being associated with a network prefix, the method comprising:

accessing one or more of a border gateway protocol peering table, a static route table, an open shortest path first route summarization table, and a network topology table [Fig. 2 and 4-5, page 1, paragraphs 0010 and page 3, Paragraphs 0031-36];

determining whether one or more of the accessed tables contains the network prefix [Fig. 4 and page 3, Paragraphs 0022-36]; and

determining an identity of the network device using the accessed tables when at least one of the accessed tables is determined to contain the network prefix [an example of device identity could be router name, router type, router location, border area router, edge linking router, router with next-hop interface , backbone linking router, router where the packet is received and router where the packet is to exit. See page 2,

paragraphs 0022-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051. See also page 4, paragraph 0039 and Figs. 4 and 5].

As per claim 21, Feldmann teach a method wherein the determining an identity includes:

determining router information, interface information, and association information [Fig. 1, page 2, Paragraphs 0024-31. See also page 4, paragraph 0039 and page 5, paragraphs 0048-0051].

As per claim 22, Feldmann teach a system for determining an identity of a network device, the network device being associated with a network prefix, the system comprising:

a memory configured to store one or more of a border gateway protocol peering table, a static route table, an open shortest path first route summarization table, and a network topology table [relevant information is extracted from a collection of router configuration files in order to populate the data model. The information that is extracted and parsed as shown in figure 5 include network-wide view of topology and configuration information such as routing protocols (static routes, RIP, BGP and OSPF) in which forwarding table is constructed [Fig. 2, page 2, paragraphs 0024 and fig. 4, data model 450. See also paragraphs 0066]; and

a processor (Fig. 2, 210) configured to:

access, from the memory, one or more of the border gateway protocol peering table, the static route table, the open

shortest path first route summarization table, and the network topology table [Figs. 4 and 5; page 1, paragraphs 0010 and page 3, Paragraphs 0031-34];

determine whether one of the accessed tables contains the network prefix [page 1, paragraphs 0010 and page 3, Paragraphs 0031-36]; and

determining an identity of the network device using the accessed tables when at least one of the accessed tables is determined to contain the network prefix [an example of device identity could be router name, router type, router location, border area router, edge linking router, router with next-hop interface , backbone linking router, router where the packet is received and router where the packet is to exit. See page 2, paragraphs 0022-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051. See also page 4, paragraph 0039 and Figs. 4 and 5].

As per claim 23, Feldmann teach a system wherein, when determining an identity, the processor is configured to:

determine router information, interface information, and association information [Fig. 1, page 2, Paragraphs 0022-34].

As per claim 24, Feldmann teach a computer-readable medium containing instructions for controlling at least one processor to perform a method that determines an identity of a network device,

the network device being associated with a network prefix, the method comprising:

accessing, from a router, one or more of a border gateway protocol peering table, a static route table, an open shortest path first route summarization table, and a network topology table [Figs. 4 and 5; page 1, paragraphs 0010 and page 2, paragraphs 0022 to page 3, Paragraphs 0031-36];

determining an identity of the network device using the accessed tables when at least one of the accessed tables is determined to contain the network prefix [an example of device identity could be router name, router type, router location, border area router, edge linking router, router with next-hop interface , backbone linking router, router where the packet is received and router where the packet is to exit. See page 2, paragraphs 0022-0028 and page 3, Paragraphs 0030-36 and page 5, paragraphs 0048-0051. See also page 4, paragraph 0039 and Figs. 4 and 5].

As per claim 25, Feldmann teach the computer-readable medium of claim 24 wherein the determining an identity includes:

determining router information, interface information, and association information [Fig. 1, page 2, Paragraphs 0024-36].

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

6. The prior made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yasin Barqadle whose telephone number is 703-305-5971. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Burgess can be reached on 703-305-9717. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Yasin Barqadle

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